



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

The negroes who come to us must have their families, if they are to remain more than a few months.

Before we can make progress in this great work, we must face the truth and lay broad foundations. This is impossible if we continue to permit this work to be the sport of politicians and the jobbery which inevitably springs from an enterprise where there are half a dozen commanding generals, immense opportunities for mistakes, miles of red tape, and many millions of dollars yet to spend.

GEOGRAPHICAL RECORD.

AFRICA.

TWO ARTICLES ON THE MAHARI (dromedary or African camel)—one by Capt. Mathieu and the other by E. Michal, interpreter, etc.—deserve notice, the former for its information on reproduction and raising of the dromedary, the other for a detailed account of the diseases and accidents to which the animal is exposed. Not less than twenty-six infirmities or lesions are enumerated, and—what is more valuable still—the methods for relief used by the Arabs are circumstantially given. For zoological gardens or wherever attempts are made to introduce the camel away from its home, the article of Mr. Michal is of importance.—(*Bulletin of the Société de Géographie d'Alger et de l'Afrique du Nord, &c.*, 1905, third quarter.)

ACROSS MADAGASCAR.—An entertaining and matter-of-fact description of a journey from Tamatave to Maintirano in 1902, by E. F. Aside from pleasing descriptions, it contains some not indifferent data concerning the early history of the Hovas, the information (not new) that these did not by any means control the whole island, and considerable ethnologic information of a cursory kind. The opinion as to the value of Madagascar for France is certainly not exaggerated.—(*Bulletin, Société de Géographie d'Alger.*)

THE BERBER WOMAN IN ETHNOLOGY AND ALGERIAN HISTORY.—This post-humous paper of Lieut.-Col. Rinn deals with the position of woman among the Berbers, but begins with a defense of Mahommedanism in its relations to the female, asserting that "the supremacy of Islam in Berber society has frequently maintained and legitimized the part played by woman, in the ethnology and history of northern Africa." The interesting fact is established that the Berbers, in times long past, had matriarchy, the names of many of their subdivisions as well as tradition indicating descent in the female line. Follows a long list of women celebrated among the Berbers for remarkable actions, all given in support of the claim that Mohammedanism concedes to woman a much higher place than generally supposed. Since the author of this rather imperfect essay is no longer among the living: *De mortuis nihil nisi bene.*—(*Bulletin, Soc. de Géog. d'Alger.*)

A LIVING OKAPI SEEN.—Captain Boyd Alexander of the Alexander-Gosling Expedition, which arrived early in March at Bima in the Congo Free State, has

written to England that the expedition has secured a specimen of the okapi and that he has seen the animal alive. A letter from Captain Gosling, under date of February 26, says that Captain Alexander is sending a description of the specimen secured. The interest in this curious ruminant, which is related to the giraffe but simulates the zebra in its markings, is due to the fact that it was discovered by Johnston only a few years ago and is confined to a narrow habitat in the northeast part of the Congo Free State, though in past geological ages it appears to have been distributed much more widely, and even to have inhabited the south of Europe. At least it is asserted that it is practically an okapi which Professor Gaudry found in a fossil state in the pikermi beds, Peloponnesus, and which was named the *Helladotherium*. Captain Gosling sends some notes on the okapi as it exists in the forests of the Welle, Libuati, and Rubi Rivers, which will be read with interest:

The okapi here is generally found singly or in pairs, but Mobatti hunters say that sometimes three are found together. An essential to its life is a small stream with some swampy and muddy ground on either side. In this grows a large leaf that on its single stock attains a height of ten feet. The young leaf of this plant is the favorite food of the okapi; and I venture to say that where the plant is not found the animal will not exist. During the night he will wander along in the mud and water in search of it. Here he may be found feeding as late as 8 A.M., after which he retires to the seclusion of the forest, where he remains till nearly dusk. On the three occasions that I was at close quarters with the beast he was perfectly concealed in this water leaf. Near the river Welle I found his spoor on ground frequented by buffalo and water buck; but this is unusual, and his companions in the forest are the elephant, the greater bush buck, and the yellow-backed and small red duikers. The okapi is very quick of hearing. He is killed occasionally by the natives, being speared, shot, or trapped by the common African methods. At the first village I visited three had been speared at various times.

AMERICA.

THE CALIFORNIA EARTHQUAKE.—On the 21st of April the Governor of California issued the following letter:

TO WHOM IT MAY CONCERN:

The bearer, Professor A. C. Lawson, of the State University, together with Professor G. K. Gilbert of the United States Geological Survey, Professor Fielding Reid of Johns Hopkins University, Professor J. C. Branner of Stanford University, Professor A. O. Leuschner of the State University, Professor George Davidson of the State University, Professor Charles Burkhalter of the Chabot Observatory, and Professor William Wallace Campbell, Director of the Lick Observatory, are hereby constituted a Committee of Inquiry into the earthquake phenomena in all parts of the State of California, and the citizens of the State are hereby requested to co-operate with this committee in all possible ways, affording them all necessary information and access to the results of the earthquake disturbances.

Dated Oakland, Cal., April 21, 1906.

GEO. C. PARDEE,
Governor of California.

The Commission met for purposes of organization on April 24, at 12 o'clock noon, in the University of California. Professor Andrew C. Lawson was elected Chairman, and Professor A. O. Leuschner Secretary. For purposes of correspondence it was decided that the Commission should be known as the "State Earthquake Investigation Commission." It was determined that the scope of the work of the Commission in its preliminary stages should embrace the questions as to the origin, the position, and the character of the disturbance in the earth's crust which gave rise to the earthquake, these questions to be investigated by:

1. The location of fault scarps and other deformations of the surface of the ground or sea-bottom in the region affected;
2. The collection of intensity records leading to the construction of coseismal curves;
3. The collection of intensity records and their classification in a graded scale leading to the construction of isoseismal curves.

The Preliminary Report of the Commission, submitted May 31, is as follows:

One of the remarkable features of the Coast Ranges of California is a line of peculiar geomorphic expression which extends obliquely across the entire width of the mountainous belt from Mendocino County to Riverside County. The peculiarity of the surface features along this line lies in the fact that they are not due, as nearly all other features of the mountains are, to atmospheric and stream erosion of the uplifted mass which constitutes the mountains, but have been formed by a dislocation of the earth's crust, or rather a series of such dislocations, in time past, with a differential movement of the parts on either side of the plane of rupture. In general this line follows a system of long narrow valleys, or where it passes through wide valleys it lies close to the base of the confining hills, and these have a very straight trend; in some places, however, it passes over mountain ridges, usually, at the divide separating the ends of the two valleys; it even in some cases goes over a spur or shoulder of a mountain. Along this line are very commonly found abrupt changes in the normal slope of the valley sides, giving rise to what are technically known as scarps. These scarps have the appearance of low precipitous walls which have been usually softened and rounded somewhat by the action of the weather. Small basins or ponds, many having no outlet, and some containing saline water, are of fairly frequent occurrence, and they usually lie at the base of the small scarps. Trough-like depressions also occur bounded on both sides by scarps. These troughs and basins can only be explained as due to an actual subsidence of the ground, or to an uplift of the ground on one side or the other, or on both sides. The scarps similarly can only be ascribed to a rupture of the earth with a relative vertical displacement along the rupture plane. Frequently small knolls or sharp little ridges are found to characterize this line, and these are bounded on one side by a softened scarp, and separated from the normal slope of the valley side by a line of depression. In many cases these features have been so modified and toned down by atmospheric attack that only the expert eye can recognize their abnormal character; but where their line traverses the more desert parts of the Coast Range, as for example in the Carissa Plains, they are well known to the people of the country, and the aggregate of the features is commonly referred to as the "earthquake crack."

This line begins on the north at the mouth of Alder Creek near Point Arena and extends southeasterly nearly parallel with the coast line to a point about two miles below Fort Ross, a distance of forty-three miles. Here it passes outside of the shore line and is again met with at the point where Bodega Head joins the mainland. Thence it appears to continue southward through Tomales Bay and Bolinas Lagoon. Beyond Bolinas Lagoon it passes outside of the Golden Gate and enters the shore again at Mussel Rock, eight miles south of the Cliff House. From this point it is traceable continuously along the valley line occupied by San Andreas and Crystal Springs Lakes, past Woodside and Portola, over a saddle back of Black Mountain, thence along Stevens Creek Cañon, passing to the southwest of Table Mountain and Congress Springs to the vicinity of Wrights, on the narrow-gauge railway between San José and Santa Cruz. From Wrights it continues on in the same course through the Santa Cruz Mountains to the point where the Southern Pacific Railway crosses the Pajaro River near Chittenden. From the crossing of the Pajaro the line extends up the valley of the San Benito River, across the eastern portion of Monterey County, and thence follows the northeastern side of the valley of the San Juan River and the Carissa Plains to the vicinity of Mount Pinos, in Ventura County. The line thus traced from Point Arena to Mount Pinos has a length of 375 miles, is remarkably

straight, and cuts obliquely across the entire breadth of the Coast Ranges. To the south of Mount Pinos the line either bends to the eastward following the general curvature of the ranges or is paralleled by a similar line offset from it *en echelon*; for similar features are reported at the Tejon Pass and traceable thence though less continuously across the Mojave Desert to Cajon Pass and beyond this to San Jacinto and the southeast border of the Colorado Desert. The probability is that there are two such lines, and that the main line traced from Point Arena to Mount Pinos is continued with the same general straight trend past San Fernando and along the base of the remarkably even fault scarp at the foot of which lies Lake Elsinore. But, leaving the southern extension of the line out of consideration as somewhat debatable, we have a very remarkable physiographic line extending from Point Arena to Mount Pinos which affords every evidence of having been in past time a rift, or line of dislocation, of the earth's crust and of recurrent differential movement along the plane of rupture. The movements which have taken place along this line extend far back into the Quaternary period, as indicated by the major, well-degraded fault scarps and their associated valleys; but they have also occurred in quite recent times, as is indicated by the minor and still undegraded scarps. Probably every movement on this line produced an earthquake, the severity of which was proportionate to the amount of movement.

The cause of these movements in general terms is that stresses are generated in the earth's crust which accumulate till they exceed the strength of the rocks composing the crust and they find a relief in a sudden rupture. This establishes the plane of dislocation in the first instance, and in future movements the stresses have only to accumulate to the point of overcoming the friction on that plane and any cementation that may have been effected in the intervals between movements.

The earthquake of the 18th of April, 1906, was due to one of these movements. The extent of the rift upon which the movement of that date took place is at the time of writing not fully known. It is, however, known from direct field observations that it extends certainly from the mouth of Alder Creek near Point Arena to the vicinity of San Juan in San Benito County, a distance of about 185 miles. The destruction of Petrolia and Ferndale in Humboldt County indicates that the movement on the rift extended at least as far as Cape Mendocino, though whether the line of rift lies inland or off shore in that region is still a matter of inquiry. Adding the inferred extension of the movement to its observed extent gives us a total length of about three hundred miles. The general trend of this line is about N. 35° W., but in Sonoma and Mendocino counties it appears to have a slight concavity to the northeast, and if this curvature be maintained in its path beneath the waters of the Pacific it would pass very close to and possibly inside of Capes Gordo and Mendocino. Along the 185 miles of this rift where movement has actually been observed the displacement has been chiefly horizontal on a nearly vertical plane, and the country to the southwest of the rift has moved northwesterly relatively to the country on the northeast of the rift. By this it is not intended to imply that the northeast side was passive and the southwest side active in the movement. Most probably the two sides moved in opposite directions. The evidence of the rupture and of the differential movement along the line of rift is very clear and unequivocal. The surface soil presents a continuous furrow, generally several feet wide, with transverse cracks, which show very plainly the effort of torsion within the zone of the movement. All fences, roads, stream courses, pipe lines, dams, conduits, and property lines which cross the rift are dislocated. The amount of dislocation varies. In several instances observed it does not exceed six feet. A more common measurement is eight to ten feet. In

some cases as much as fifteen or sixteen feet of horizontal displacement has been observed, while in one case a roadway was found to have been differentially moved twenty feet. Probably the mean value for the amount of horizontal displacement along the rift line is about ten feet, and the variations from this are due to local causes, such as drag of the mantle of soil upon the rocks or the excessive movement of soft, incoherent deposits. Besides this general horizontal displacement of about ten feet there is observable in Sonoma and Mendocino counties a differential vertical movement not exceeding four feet, so far as at present known, whereby the southwest side of the rift was raised relatively to the northeast side, so as to present a low scarp facing the northeast. This vertical movement diminishes to the southeast along the rift line, and in San Mateo County is scarcely if at all observable. Still farther south there are suggestions that this movement may have been in the reverse direction; but this needs further field study.

As a consequence of the movement it is probable that the latitudes and longitudes of all points in the Coast Ranges have been permanently changed a few feet, and that the stations occupied by the Coast and Geodetic Survey in their triangulation work have been changed in position. It is hoped that a reoccupation of some of the stations by the Coast and Geodetic Survey may contribute data to the final estimate of the amount of movement.

The great length of the rift upon which movement has occurred makes this earthquake unique. Such length implies great depth of rupture, and the study of the question of depth will, it is believed, contribute much to current geophysical conceptions.

The time of the beginning of the earthquake as recorded in the Observatory at Berkeley was 5^h. 12^m. 6^s. A. M., Pacific Standard time. The end of the shock was 5^h. 13^m. 11^s. A. M., the duration being 1^m. 5^s. Within an hour of the main shock twelve minor shocks were observed by Mr. S. Albrecht of the Observatory and their time accurately noted. Before 6^h. 52^m. P. M. of the same day thirty-one shocks were noted in addition to the main disturbance. These minor shocks continued for many days after April 18, and in this respect the earthquake accords in behavior with other notable earthquakes in the past. The minor shocks which succeed the main one are interpreted generally as due to subordinate adjustments of the earth's crust in the tendency to reach equilibrium after the chief movement.

The collection of time records necessarily proceeds slowly. The purpose of the coseismic curves based upon these records is in general two-fold. In ordinary earthquakes it is one of the means of locating the seat of the disturbance when there is no surface manifestation of the rupture in the earth's crust. In the present instance, however, the rupture has declared itself in an unmistakable rift observable at the surface, and coseismals are therefore unnecessary for the determination of this important factor in the general problem, so far at least as regards the main disturbance. It is probable, however, that so radical a change in the equilibrium of the stresses of the earth's crust would induce secondary ruptures and consequently secondary earthquakes closely associated with the chief shock. The careful plotting of the time records may, therefore, be useful in revealing the location of these secondary disturbances, such, for example, as the one which affected Southern California on the afternoon of the 18th of April. The second purpose of securing time records is the determination of the velocity of propagation of the earth wave; and the data for this which are likely to be most serviceable are the records obtained at various quite distant seismographic stations.

The destructive effects of the earthquake are in the main distributed with refer-

ence to the line of rift. The exact limits of the area of destruction have not yet been mapped, but it is known to extend out about twenty-five or possibly thirty miles on either side of the rift. On the southwest side the greater part of this area to the north of the Golden Gate lies in the Pacific. This area extends from Eureka in Humboldt County to the southern extremity of Fresno County, a distance of about four hundred miles.

Beyond this area of destructive shock the earthquake was felt in its milder manifestations over a wide territory. Our reports to date show that it was felt in Oregon as far north as Coos Bay and on the south as far as Los Angeles. To the east it was felt over the greater part of middle California and eastern Nevada, particularly along the eastern flank of the Sierra Nevada. It was felt at Lovelocks, and we have unconfirmed reports of its having been felt at Winnemucca. Far beyond the region within which it was apparent to the senses, however, the earth wave was propagated both through the earth and around its periphery; and some of the most valuable and most accurate records of the disturbance which we have are those which were registered at such distant seismographic stations as Washington, D. C.; Sitka, Alaska; Potsdam, Germany; and Tokyo, Japan.

Within the area of destructive effects approximately 400 by 50 miles in extent the intensity varied greatly. There was a maximum immediately on the rift line. Water pipes, conduits, and bridges crossing this line were rent asunder. Trees were uprooted and thrown to the ground in large numbers. Some trees were snapped off, leaving their stumps standing, and others were split from the roots up. Buildings and other structures were in general violently thrown and otherwise wrecked, though some escaped with but slight damage. Fissures opened in the earth and closed again, and in one case reported a cow was engulfed. A second line of maximum destruction lies along the floor of the valley system of which the Bay of San Francisco is the most notable feature, and particularly in the Santa Rosa and Santa Clara valleys. Santa Rosa, situated twenty miles from the rift, was the most severely shaken town in the State, and suffered the greatest disaster relatively to its population and extent. Healdsburg suffered to a nearly similar degree. San José, situated thirteen miles, and Agnews, about twelve miles from the rift, are next in the order of severity. Stanford University, seven miles from the rift, is probably to be placed in the same category. All of these places are situated on the valley floor and are underlain to a considerable depth by loose or but slightly coherent geological formations, and their position strongly suggests that the earth waves as propagated by such formations are much more destructive than the waves which are propagated by the firmer and highly elastic rocks of the adjoining hill lands. This suggestion is supported by a consideration of the destructive effects exhibited by towns and single buildings along the same valley line which are situated wholly or partly on rock. Petaluma and San Rafael, though nearer the rift than Santa Rosa, suffered notably less, and they are for the most part on, or close to, the rocky surface. The portions of Berkeley and Oakland which are situated on the alluvial slope suffered more than the foothills, where the buildings are founded on rock. The same suggestion is further supported from a consideration of the zone of maximum destructive effect on the southwest side of the rift. This zone lies in the Salinas Valley. The intensity of destructive action at Salinas was about the same as at San José, and the town is situated on the flood-plain deposits of the Salinas River. Along the banks of the Salinas River and extending from Salinas to the vicinity of Gonzales, so far as our reports at present show, the bottom lands were more severely ruptured, fissured, and otherwise deformed than in any other portion

of the State. The Spreckels Sugar Mill, situated on the banks of the river, suffered more severely probably than any other steel structure in the State. Santa Cruz, on the other hand, which is on the same side of the rift and at the same distance from it, but which is built on rock for the most part, suffered much less damage. In the northern counties along the coast the most severe effects were felt at Ferndale, on the south margin of the flood plain of the Eel River, and at Petrolia, on the bottom land of the Mattole. Fort Bragg was severely shaken with very destructive effects, but our reports do not yet indicate the character of the ground upon which it is situated.

In the facts which have been cited we seem to have warrant for a generalization as to the excessively destructive effect of the earth wave as transmitted by the little coherent formations of the valley bottoms. But it must be borne in mind that by far the greater number of structures subject to destructive shock are situated in the valley lands and that there has not yet been time for a detailed comparison of the effects in the valleys with those in the hills, where the buildings are founded on firm rock except in a few notable instances.

The most instructive of these instances is the city of San Francisco, and the facts observed there are entirely in harmony with the generalization above outlined. In the city of San Francisco we may recognize for preliminary purposes four types of ground: (1) The rocky hill slopes; (2) the valleys between the spurs of the hills which have been filled in slowly by natural processes; (3) the sand dunes; (4) the artificially filled land on the fringe of the city. Throughout the city we have a graded scale of intensity of destructive effects which corresponds closely to this classification of the ground. The most violent destruction of buildings, as everybody knows, was on the made ground. This ground seems to have behaved during the earthquake very much in the same way as jelly in a bowl, or as a semi-liquid material in a tank. The earth waves which pass through the highly elastic rocks swiftly with a small amplitude seem in this material to have been transformed into slow undulations of great amplitude which were excessively destructive. The filled-in material and the swampy foundation upon which it rests behaved, in other words, as a mass superimposed upon the earth's surface, rather than as a part of the elastic crust itself. In a less degree the same thing is true of the sand-dune areas, where the ground was frequently deformed and fissured. In still less degree the naturally filled valleys between the hill spurs were susceptible to this kind of movement, and the destruction of buildings was correspondingly less, but still severe, depending very largely on the character of the buildings, the integrity of their construction, etc. In portions of these valleys, however, the original surface of the ground has been modified by grading and filling, and on the filled areas the destruction was more thorough than elsewhere in the same valley tracts. On the rocky slopes and ridge tops, where, for the most part, the vibration communicated to buildings was that of the elastic underlying rocks, the destruction was at a minimum. On some of the hills chimneys fell very generally and walls were cracked; on others even the chimneys withstood the shock.

While this correlation of intensity of destructive effect appears to hold as a generalization, there are well-known exceptions which find their explanation in the strength of the structures. Modern class A steel structures with deep foundations appear to have been relatively passive, while the made ground in their immediate vicinity was profoundly disturbed. Thoroughly bonded and well-cemented brick structures, on similarly deep and solid foundations, seem to have been equally competent to withstand the shock, except for occasional pier-like walls not well tied to the rest of the

building. The weak points in wooden frame structures were in general the faulty underpinning and lack of bracing, and chimneys entirely unadapted to resist such shocks. With these faults corrected, frame buildings of honest construction would suffer little damage beyond cracking of plaster in such a shock as the 18th of April, save on the made ground, where deep foundations and large mass appear to be essential for the necessary degree of passivity.

Pipe lines and bridges crossing the rift line present a peculiar, if not quite unique, engineering problem which will doubtless be solved in the near future. Pipe lines on low swampy ground or in made ground are in much greater danger of destruction from earthquake shocks than those on high ground underlain by rock, except in the immediate vicinity of the rift, where nothing could be constructed which would withstand the violence of the earth movement.

One of the lessons of the earthquake which seems peculiarly impressive is the necessity for studying carefully the site of proposed costly public buildings where large numbers of people are likely to be congregated. In so far as possible such sites should be selected on slopes upon which sound rock foundation can be reached. It is probably in large measure due to the fact of their having such a rock foundation that the buildings of the State University, at Berkeley, escaped practically uninjured. The construction of such buildings as our public schools demands the most earnest attention of the people and of the authorities charged with their construction. A great many of our schools proved to be of flimsy construction and ill adapted to meet the emergency of an earthquake shock of even less severity than that of the 18th of April.

The Commission, in presenting this brief report, has had in mind the demand on the part of the people of the State and of the world at large for reliable information as to the essential facts of the earthquake. It has, therefore, not presumed to engage in any discussion of the more abstruse geological questions which the event naturally raises. It leaves such discussion for a more exhaustive report, which can only be prepared after the campaign of data collection is complete, and that may be some months hence.

Very respectfully submitted in behalf of the Commission,

ANDREW C. LAWSON,
Chairman.

A. O. LEUSCHNER,
Secretary.

EUROPE.

THE NEW MAP OF PARIS.—A letter to the Society from Paris says that the Service Géographique de l'Armée, to which is entrusted the entire topographic survey work of the country, is making excellent progress with the new map of France in eight or nine colours which is being published on the scale of 1:50,000, or 0.7 statute mile to an inch. The sheets thus far issued are very fine specimens of cartographic art. The Paris sheet has just been completed, and was about to be placed on the market.

All who are interested in this new map should read the detailed articles upon it published in the *Annales de Géographie* in March, 1904, by Prof. Vidal de la Blache, and in May, 1905, by Mr. Emm. de Margerie. The first article is accompanied by a specimen sheet of l'Isle-Adam; the second has a map showing the progress of the work. Nine sheets of the environs of Paris were published last year. The surveys are being conducted in the field on a scale of

1:10,000 in regions of moderate relief and of 1:20,000 in mountainous regions. Surveys on these scales are to form the basis of the new cartography of France. It is probable that the next publications will be maps of the environs of the other large cities of the country. It is estimated that the cost of producing the entire map will be \$6,000,000; and as the appropriations thus far voted are small, it is likely that the progress of the map will be slow.

FOUR-COLOUR PRESS FOR MAPS.—Among the comparatively new machines used in map production is a four-colour press employed in one of the largest commercial map houses in Paris, which prints a map in four colours simultaneously at one feed by a very ingenious device which prevents the rollers of the wrong colour from touching the plate.

NINTH INTERNATIONAL GEOGRAPHICAL CONGRESS (GENEVA).—The Committee on Organization held a meeting on the 2nd of June.

Three Honorary Presidents have been named: The President of the Swiss Confederation, in office in 1908; the President of the Council of State of Geneva, for the same year; and H. M. the King of Rumania.

The list of Honorary Vice-Presidents includes the four surviving Presidents of previous International Geographical Congresses.

The Circular of Invitation and the text of the General Preliminary Arrangements will be published in November next.

A MAGAZINE FOR GLACIOLOGY.—The news and literature of most of the earth-studies reach the interested public through journals or bulletins that are devoted to these specialities. Glaciology, however, has been without an organ, in spite of its growing literature and the many specialists who for some decades have given much attention to it. This lack is supplied at last by the appearance of the *Zeitschrift für Gletscherkunde, für Eiszeitforschung, und Geschichte des Klimas*. The first number (May, 1906) is a handsome magazine of 80 pp. Dr. Eduard Brückner, Professor of Geography at the University of Halle on the Saale, is the editor, and the publication is the organ of the International Glacier Commission, with Professors Forel, J. Geikie, Nansen, Penck, and H. F. Reid, Mr. Charles Rabot, and other well-known geologists and glaciologists associated in the management. The magazine, which is to appear at intervals, with from four to five numbers in a volume, is priced at 16 marks per volume, and is handsomely printed in large type, with a number of diagrams and half-tone photographs. Four leading articles occupy, with an introductory announcement by the editor, 60 pages, a department of news, notes, and minor contributions 10 pages, and there are five pages of concise book reviews, and a bibliography, in which it is expected to cover the literature of glaciology and historical climatology, beginning with 1905. These departments will appear in every number.

Two of the leading articles are in German, one in French, and one in English, the latter being by Prof. J. Geikie, on "Late Quaternary Formations of Scotland," in which he presents new evidence for the accuracy of his belief that the formations which in the British Islands are classed as "Postglacial" afford striking evidence of climatic oscillations and that these formations cannot be separated from the glacial series.

One of the most striking illustrations is a view of the Antarctic inland ice as seen from the Gaussberg. It accompanies a long note by Dr. Drygalski on the movement of the Antarctic inland ice, in which he says that in King William II.

Land the inland ice, at the point of observation, was moving to the sea at the rate of 50 meters in five months, or about a third of a meter a day; he contrasts this with the movement of 18 meters a day of a Greenland ice stream between rock walls, while the former is a movement of ice over a comparatively even surface.

This new publication makes a decidedly favourable impression as a scientific journal of high rank, carefully edited, and produced in the best manner.

OCEANOGRAPHY.

DRIFTS IN THE PACIFIC OCEAN.—For a number of years the Government of New South Wales has been distributing to shipmasters trading to Sydney printed papers to be enclosed in bottles and thrown overboard. A considerable number of these blank forms, filled out by those who cast them into the sea or who recovered them, has been returned to Sydney. Mr. H. A. Lenehan publishes in the *Journal and Proceedings* of the Royal Society of New South Wales for 1904 the latest of a series of eight papers on these drift returns. Several valuable returns are recorded, the most interesting of which relates to a paper that was cast adrift within a few miles of the California coast, probably just outside the influence of the coastal inset, and travelled a distance of 11,350 miles, nearly half circumnavigating the globe before reaching its terminal point on the island of Boillon in the Java Sea. It is the first record received of drift in that part of the North Pacific Ocean. It is supposed that when the paper was put overboard on July 19, 1901, winds were blowing off the land and so drove it into the great North Pacific drift. It was carried to the south, and thence along to the westward, in latitudes between 0° and 20° N., when it probably got into the north equatorial current. From thence it passed through Malacca Straits to the spot where it was discovered.

Another paper had both a long and rapid drift. It was put into the sea a few degrees south of the equator in long. $88^{\circ} 47'$ E. and threaded its way through Torres Strait to the Solomon Islands, passing through a veritable network of reefs and islands. The drift was 4,830 miles at a daily rate of 21.6 miles, the fastest recorded. Six papers from the Indian Ocean have been found on the coast of Africa, five of which followed well-known courses; but one, which from what is known of the drifts might be supposed to be destined for the coast of Cape Colony, was picked up at Mombasa.

In the Atlantic Ocean, three papers thrown overboard in the Bay of Biscay, south of the Canary Islands and west of St. Helena, respectively, found their way to the West Indies, the drift farthest north being the slowest and the one south of the equator the fastest. There were several important records from the Southern Ocean, some of the papers reaching the Australian coast, one making its way to the north of New Zealand near Kaipara Heads and another to Aneiteum, New Hebrides. The fastest drift was 9.7 miles a day and the slowest at a daily rate of 1.4 miles. Some anomalies were found in the Great Australian Bight, where the charts show that the drift is to the eastward; yet three of the papers had a noteworthy westerly set.

THE EARLIEST ITALIAN PUBLICATION ON OCEANOGRAPHY is, according to Roberto Almagia, the *Relazione del Mare*, written by Giovanni Botero and printed at Rome in 1599. A short but comprehensive (for its time) treatise of what was then known or believed to be known concerning the sea and its relations to the land and the atmosphere, including the tides, which Botero says are generally

believed to be due to the moon. A number of other phenomena related to the ocean are discussed in the little treatise, which the critic describes with care, impartiality, and adequate knowledge of the subject.—(*Bollettino della Società geografica Italiana*, Serie IV, Vol. VII, 4. April 1906, *Comunicazioni e Relazioni*.)

OCEANOGRAPHICAL MUSEUMS.—*The Geographical Journal* (June, 1906) says that the Prince of Monaco has decided to transfer to Paris the Oceanographical Institute founded by him at Monaco, and has set apart the sum of \$800,000 for its maintenance, besides endowing it with the Museum established by him and all the scientific appliances connected with it. The management of the Institute, which will be placed on ground acquired with the Prince's aid by the University of Paris, will be vested in an international committee of specialists.

AN OCEANOGRAPHICAL MUSEUM has also been established in Berlin in connection with the Institut für Meereskunde. It was opened on March 5. The Museum is divided into four sections: (1) A collection illustrating the Imperial Navy, containing pictures and models of warships, and specimens of guns, torpedoes, etc.; (2) a popular and historical collection illustrating the progress of navigation, with models of modern and primitive vessels, life-saving apparatus, etc.; (3) a collection of instruments, etc., used in the study of the ocean and its contents, with numerous models showing the height of the continents and the depths of the ocean, the weight and volume of land and sea respectively in relation to those of the whole earth, the amount of salt in the sea, etc.; (4) a collection illustrating the biology of the ocean and the fisheries, with examples of the products of economic value.

INSTRUCTION IN OCEAN RESEARCH.—The Oceanographical Institute of Bergen Museum announces that courses in ocean research will be held, as last year, in Bergen, Norway, during the university vacation from Aug. 8 to Oct. 15. The courses will consist partly of lectures, partly of practical instruction and assistance in laboratory work. During the excursions the use of appliances and instruments will be demonstrated. The lectures are so arranged that all may be attended by students who desire to do so. Dr. A. Appellöf will lead examinations of forms of the fish and invertebrate animals in the fiords and North and Norwegian Seas, lecture on the distribution of bottom fauna, and conduct excursions in the adjacent fiords. Dr. D. Damas will have charge of animal plankton and ordinary plankton biology and Mr. E. Jørgensen of plankton algæ. Mr. B. Heland-Hansen will give instruction on methods of oceanographic investigations, review the results of researches in north European waters, and lecture on theoretical oceanography. Docent C. F. Kolderup will lecture on ocean-bottom deposits and glacial and post-glacial deposits in Norway. Those who wish further information should write to the Institute at Bergen.

POLAR.

CAPTAIN MIKKELSEN'S EXPEDITION.—A letter from Captain Mikkelsen, dated June 23, announces the arrival of his Arctic party at Dutch Harbour, Unalaska Island, at the entrance to Bering Sea. On the way north the party spent ten days at Kadiak Island. The ship which Captain Mikkelsen purchased has given much satisfaction, as she is a fine sea boat and easily handled. At the time of writing, Captain Mikkelsen expected to go north to Cape Deshnev, Siberia, to purchase dogs

and then to go to Nome, from which place he hoped to sail for the Arctic Ocean on or about July 25.

THE PRINCE OF MONACO IN ARCTIC WATERS.—The Prince of Monaco left the Mediterranean on his yacht, *Princesse Alice*, on June 20, to spend considerable time in researches in and near Spitsbergen. His studies will include the sea depths, the upper air, and the interior of Spitsbergen. He will investigate the upper atmosphere by means of balloons, as in his experiments in the region of the northeast trades last summer, and will also send one or more parties to explore the interior of Spitsbergen.

NEW MAPS.

AFRICA.

EGYPT.—Egypt. Scale, 1:50,000, or 0.7 statute mile to an inch. Sheets: I-I N.W.; I-II S.E.; II-I S.E.; II-II S.E.; III-II S.E.; XXIV-VII S.E.; XXIX-VIII S.E. Survey Département, Cairo, 1906.

These are the first sheets of the topographical map of Egypt on a scale of 1:50,000 which the Survey Department has just begun to publish. They delineate regions along or near the Nile in the Mudirias of Giza, Qena, and Aswan. The sheets within the map borders are 18 by 20 inches. The hydrography, including the canals, is in blue, the names and all cultural features, excepting the canals, are black, and the desert areas white. The information is detailed and very clearly expressed. The Mudiria and Markaz boundaries, canals, villages, banks, roads, and bench marks are given. The nomenclature is both in English and Arabic. The new map will be a great addition to the cartography of Egypt.

GERMAN SOUTHWEST AFRICA.—Farm Übersichtskarte von Teilen der Bezirke Windhuk und Karibib. Scale, 1:200,000, or 3.1 statute miles to an inch. Prepared in the Imperial Land Survey Office, Windhuk. *Mitteil. v. Forschungsreis. u. Gelehrt. aus den Deutsch. Schutzgeb.*, Vol. 19, No. 2, Berlin, 1906.

These land holdings are devoted almost wholly to grazing, and many have an area of thirty to forty square miles. The names of the farms and the farm boundaries are distinguished by green, watercourses in blue, topography in brown, and elevations in figures.

TOGO.—Karte von Togo. Scale, 1:200,000, or 3.1 statute miles to an inch. (Dr. Kete-Kratschi.) *Mitteil. v. Forschungsreis. u. Gelehrt. aus den Deutsch. Schutzgeb.* Vol. 19, No. 2, Berlin, 1906.

Another sheet of the map of Togo. It gives much detail concerning large districts, but shows that the courses of many tributaries of the Volta River have not yet been learned, excepting where roads cross them. The roads connecting white stations, projected roads, native paths, official and mission stations, fords and bridges, and much other information are given.

TRANSVAAL COLONY.—Map to illustrate the Physical Features of the Transvaal. Scale, 1:300,000, or 47.35 statute miles to an inch. By Tudor G. Trevor. *Geog. Jour.*, July, 1906, London.

Some physical maps of Africa have failed to give a clear idea of the areal extent of the three distinctive divisions of the country according to elevation: the High,